Macro-Economic Factors Affecting Ease of Business

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Abstract

The past hundred years has seen the largest growth in economies and markets in human history. As the world becomes more and more connected, the importance of businesses and their ability to thrive becomes increasingly important. A country's policies and its attitude towards new businesses is now relevant on both a macro and microeconomic scale. This paper attempts to examine varying factors that could affect how easy it is to conduct business within a country's borders. Our findings suggest that lending rates, access to internet and a country's GDP per capita are all determining factors in this.

Introduction

Our project examines the factors that affect the ease of emergence of new enterprises each year. Gaffeo and Santaro (2009) showed a negative correlation between business failure and economic activity. Similar studies underscore the effect of macroeconomic variability on business survival. According to the opportunity cost (OC) theory of productivity growth, aggregate disturbances in the economy may have long-run positive effects on economic growth. It is intuitive, but also empirically proven, that such activity is advantageous during recessions. Our econometric model has been designed around this theory. We hypothesize that factors such as gross domestic product per capita, income, taxes, density of new businesses and number of internet users are factors that might affect the ease of business formation. We use cross-sectional data from 109 countries around the world to test this hypothesis. This data has

been gathered in 2011, immediately after the recession of 2009. We think that analyzing this data will be an effective way of testing our hypothesis.

Each country has its own environment created by unique types of policies, demographics, and economic conditions. Knowing which factors and policies are conducive to the growth of new business could be extremely beneficial for several reasons. Countries wishing to increase the amount of innovation and expand their markets could use such information to implement new policies to move their country in that specific direction. The lack of research done in this particular subject is detrimental to developing countries that wish to emulate the previous successes of more developed countries. Therefore, awareness of the industrial demographic is essential.

Literature Review

Job creation is a lot more pronounced in younger firms and this warrants a study of the factors that influence the creation, survival and ease of creating new businesses. There are numerous factors that drive the creation and survival of small businesses or startups in the economy. It is valuable to understand the macroeconomic conditions in the economy because they affect the profitability of companies.

In a study by Fairlie and Krashinsky (2012), financial liquidity constraints have been interpreted in two ways. Typically, a greater asset base is associated with a higher rate of business entry. This is the first interpretation. However, there is a caveat to this finding; the positive relationship between wealth and nascent entrepreneurship is driven largely by a very wealthy sample set of individuals. The second interpretation involves considering sub-samples of job losers and non-job losers. Both groups have different incentives to take the entrepreneurial route. This is because a lot of people in the job losers category would not be self-employed if it wasn't for the fact that they didn't have a job in the first place. This kind of motivation has been called 'push entrepreneurship'. The second sub-group of non-job losers is self-employed because they have planned it so. Self-employment is motivated by a pre-determined plan not necessarily influenced by need. This type of motivation can be referred to as 'pull entrepreneurship'. Assets could be household assets, stocks, bonds, real estate and sum of savings.

In a paper by Caliendo and Kritikos (2007), the three most frequently quoted motivations for being self-employed are 1) termination of employment, 2) "being my own boss" and 3) "had first customers". While the latter two are typically 'pull' motives, the first is a 'push' motive that creates a job for the self-employed person. At the same time, public authorities provide startup subsidies hoping to create more jobs via these new entrepreneurs. The model under analysis showed that, making an exception of the first year, startups by the unemployed generate more income for the person as compared to what the person earned in his or her last employment. This is certainly in contradiction to the widely held belief that startups generate smaller incomes than a job held as an employee. Clearly, there is incentive to undertake entrepreneurship when unemployed and we discuss this in the model. However, as mentioned earlier, there isn't much profit earned in the first year starting out and programs such as the 'startup subsidy' and the 'bridging allowance' provide support to the startup in its initial years.

Given the aforementioned liquidity-constraints on entrepreneurs, Harris and Hossen (2005) talk about the effects of tax reductions on the growth of businesses. There is an increase in cash flow for even a marginal reduction in taxes and the incentives are two-fold. While the business-owner has a greater rate of return for the effort he or she puts in, there is also an increase in after-tax profits. Variable such as age, marital status and income were considered in a study of tax-rates and survival probabilities. Increase in tax-rates makes salary-wages more attractive, but this is uncertain. This study concluded that the decrease in marginal tax-rates on a sole-proprietor from 50 to 33% results in his or her tax receipts increasing by 28%.

A positive relationship between asset ownership and entrepreneurship has been shown. Capital market constraints are a huge factor behind business expansion and the emergence of startups.

It is known that starting a new business requires capital. The expectation is that the easier it gets for potential or nascent entrepreneurs to pay back the ensuing debt, the more they will engage in entrepreneurial activity. Meza and Webb (1996) make an interesting observation about the relationship between entrepreneurial ability and debt. More able entrepreneurs, when financed with debt, make safer choices and, thus, are less likely to default. Less able entrepreneurs, on the other hand, maker riskier choices and are more likely to default. Either way, any level of entrepreneurial ability financed with debt results in a great amount of change in the market equilibrium.

According to the US Small Business Administration (SBA), there are 28 million small businesses in the US itself. Over five million corporations filed under a million in taxes in the year 2006. This definitely goes to show that small businesses are vital to the economy. The financial crisis of 2008-09 occurred before this data was collected and that led to higher lending rates. We hypothesize that these higher lending rates negatively impacted businesses in general and small businesses specifically. We expect availability of credit to be a major determinant the ease of entry of new businesses and, consequently, their survival rate.

Another macro-variable that our analysis looks into is the number of internet users. Concepts such as "web empowerment" have been around for some time. Its role in promoting and supporting small businesses is explored by Evans and Volery (2001) as they highlight the business development services provided by the internet. These services include, but are not limited to, training, consulting, counseling and networking. One of the greatest challenges faced by potential entrepreneurs is a lack of resources. Lack of knowledge regarding marketing, management, and business startups is another problem. Internet-based knowledge is invaluable in this regard. It also plays an important role in conducting market research and learning about existing competition. New startup owners use the internet to tap into a global network of entrepreneurs and we certainly expect it to be a great contributor to ease of business.

In a paper by the National Bureau of Economic Research, serial entrepreneurs or entrepreneurs who had succeeded in the past were observed to be more likely to succeed than those launching a business for the first time. More experience and skill seems to trump other intangibles such as luck. Skill might be defined as ability to identify markets and strategize to the advantage of the firm. This type of knowledge is different from the education received at a school or a college. Our analysis controls for intangibles such as entrepreneur's skill, mindset and background.

Data

The focus of our study is to identify factors in the environment of a country that can encourage or hinder business. For a simple regression model, we examine the effect of independent variable *GDP per capita* on the dependent variable *ease of business.* The ease of business variable is an index that looks at ten different factors that impact how conducive the

environment is to starting a firm, and rates countries on this scale with lower numerical rankings as high ease of business.

Gross domestic product per capita was chosen for the simple regression because of its general acceptance as a way to evaluate a country's economic health. An economy that has a strong market likely built this market from being business friendly. General acceptance also means that data was readily available and widely accepted as legitimate.

We also conducted a multiple regression model after our simple one. Common sense dictates that there is more than one factor that affects ease of business in the environment, and merely running a simple regression model would be too restrictive to determine any true statistical significance. Hence several more variables have been added in to attempt to portray a more realistic and holistic view of the topic.

Four more independent variables have been examined along with the original *GDP per capita* to see their effects on ease of business in a country. The selected variables are new *business density, unemployment, lending rates* and *internet users*.

New business density is defined as new registrations per 1000 people between ages 15-64. The economic reasoning behind choosing this variable is simple- a larger number of businesses opening up will lead to more competition- and thus we expect to find a positive relationship between the two variables (higher business density will lead to higher ease of business numerical values which implies low ease of business).

Unemployment is the total percent of the labor force that has no form of employment and is currently seeking it. High levels of unemployment lead to difficulty in finding a job because of the ratio of people searching for jobs to the amount of openings available. The economic reasoning behind adding this variable to our regression model is that high unemployment could lead to the opening of more businesses. A dearth of jobs could lead entrepreneurs to attempt to create their own jobs as they are willing to take more risks because of a lack of steady income.

Lending rates are the interest rates banks provide to the private sector for loans. Interest rates play a key role in economics as government can use them to control monetary policy and slow or speed up an economy. They also play an enormous role in businesses- money is critical to begin a new venture. Higher interest rates deter people from taking out loans, and thus people that need loans to start a business will wait till rates fall to do so.

Internet users measures the number of people out of 100 with access to the internet. The effect of the internet on businesses is likely the most obvious to most readers. Internet gives business owners information on how to run a business, market trends, advertising techniques, and a host of other factors that could make running a business far easier. It also allows access to both more suppliers and to a larger market of consumers.

Data has been pulled from one primary source for our variables. Our analysis is done at the country level, so we used the World Bank datasets. The World Bank is considered to have some of the most current, accurate and complete data available. This is because all their numbers are compiled from officially recognized sources and because of the World Bank's Open Data Initiative, which allows the public open access to the data and the models and methods used to obtain it. All the variables excepting *new business density* were found directly through the World Bank, while that particular variable was found in Doing Business, a report that is also funded and developed by the World Bank. All data is taken from 2011.

The simple regression model we will analyze is shown as follows:

$$EOB = \beta_0 + \beta_1 gdpcap + u$$

The multiple regression model will be:

$$EOB = \beta_0 + \beta_1 gdpcap + \beta_2 NBD + \beta_3 un + \beta_4 lendrate + \beta_5 internet + u$$

with *EOB* as ease of business, *gdpcap* as gross domestic product per capita, *NBD* as new business density, *un* as unemployment, *lendrate* as lending rates, and *internet* as internet users. *U* is our error term.

The table below provides descriptive statistics of the variables being used-

```
. summarize
```

Variable	Obs	Mean	Std. Dev.	Min	Max
nbd	74	3.633784	4.513246	0	28
gdpcap	105	18717.48	23079.57	335	111813
eob	106	76.79245	53.29785	1	188
un	108	8.244444	5.257684	.3	32.2
lendrate	75	11.15467	8.014991	.5	52.5
internet	109	44.48257	28.55151	1	94.8

Table 1. Summary table of all variables

Table 1 permits us to obtain useful information such as the sample size of each of our variables, mean, standard deviation, minimum and maximum values. Detailed summaries of each variable are provided in Appendix A. The data was then examined to ensure that it met the criteria for the Gauss Markov assumptions. It is evident by looking at the equations that both the simple and multiple regression models have a linear dependence on parameters. By using as reputable a source as the World Bank, the data can safely be assumed to be random. Data has been obtained from both developed and developing economies and these countries used in the observations are well distributed over the globe to remove any regional effects or bias. A co-linearity test was run on the model, with interesting results.

```
. correlate eob gdpcap nbd lendrate un internet
(obs=55)
```

	eob	gdpcap	nbd	lendrate	un	internet
eob	1.0000					
gdpcap	-0.5695	1.0000				
nbd	-0.5181	0.2743	1.0000			
lendrate	0.5101	-0.4221	-0.2489	1.0000		
un	-0.0115	-0.2990	0.0142	0.0303	1.0000	
internet	-0.7417	0.7865	0.4508	-0.4868	-0.1166	1.0000

Table 2. Correlation matrix for all variables

Although there is no perfect collinearity between any variables, some variables seem to be strongly correlated (for example *internet* with *eob* and *internet* with *gdpcap*). The F-tests that need to be conducted with these variables in order to determine joint significance are dealt with later in the paper. The model has been chosen in such a way to capture the largest effects on ease of doing business through minimal number of variables. However, this limits the explanatory power of the model. Although omitted variable bias at any stage is inevitable, attempts have been made to limit the variable bias by considering a larger number of variables in the multiple regression model. Figure 1 in the appendix is a scatter matrix plot that shows significant variance in the variables - accounting for a few outliers. These allow us to prove the adherence of our data to the Gauss Markov assumptions in order to have a relevant discussion about the legitimacy of the data, and therefore of our models.

Results

Table 3. Summary of Results

Ease of Business				
Independent Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
GDP per capita	-0.0014 (-7.86)***	-0.0001 (-0.26)	0.000 (0.6)	-0.0008 (-3.30)***
New Business Density	-	-2.1 (-2.22)**	-2.12 (-2.25)**	-3.36 (-3.47)***
Unemployment	-	-0.67 (-0.94)	-	-
Lending Rates	-	1.02 (1.81)*	1.05 (1.87)*	1.514 (2.52)**
Internet Users	-	-0.976 (-3.32)***	-1.02 (-3.51)***	-
Intercept	100.5 (19.39)***	119.77 (7.93)***	113.76 (8.33)***	80.9 (7.35)***
No. of Observations	104	55	55	55
R-square	0.377	0.626	0.6	0.52

*Significant at 10%, **5%, ***1%

Simple Regression

Table 3 above shows the relevant numbers for all the models we tested. For the simple regression, Model 1, the coefficient for GDP per capita was extremely low, despite having the expected negative relationship and being significant at 1%. This means that the increase of ease of business for $1 extra in GDP per capita was quite small. The intercept is extremely large, confirming what was stated earlier that there are likely many variables missing from this model that could help inform ease of business. We examined r-square rather than adjusted r-square because the number of observations we had was deemed sufficient and we are only examining

one independent variable. The r-squared value ended up small, which supports our claim of missing variables as well. Therefore, it was found appropriate to move forward to a multiple regression model.

Multiple Regressions

Model 2 included all the independent variables we could find data on that appeared to possibly impact ease of business. Right away it was evident that this model needed to be scrutinized further. Two variables -*GDP per capita* and *unemployment*- were statistically insignificant even when examined at 10%. Our r-squared value jumped from 0.37 to 0.62, but this was in high probability due to the addition of so many independent variables to the model. Knowing that GDP per capita had been significant in our simple regression, it was kept in the model while dropping unemployment and running it again.

Our results in Model 3 had little change from Model 2. *GDP per capita* remained insignificant even at the 10% level, and our r-square value saw a very miniscule drop. The coefficient for the constant continued to remain extremely high. At this point it seemed obvious that there was an important issue that was affecting the results. A quick test led to Table 2, which revealed a correlation of -0.7 for both relationships. The high correlation led us to consider that two of the variables might be jointly significant, and therefore affecting the significance of the other variables.

We now conducted an f-test for the model to make our results more robust and to check whether or not *GDP per capita* and *internet* were jointly significant. The f-value came to be 12.97, which was far greater than the critical value of 3.97, so the null was soundly rejected and the variables were found to be jointly statistically significant at 5%. The decision was made to run the regression once more, this time dropping *internet* because of its high correlation to both *GDP per capita* and *ease of business*.

Our final Model 4 dropped both *unemployment* and *internet*. *GDP per capita* jumped back to 1% significance, and both new business density and lending rates continued to be significant at 1% and 5% respectively, while the t-values for all three increased. Our hypotheses seem to have held up in this model. *Lending rates* display the positive relationship to *ease of business* that was hypothesized as high rates lead to low ease of business because of

unwillingness to take out loans. *New business density* saw a negative relationship with *ease of business.* The intercept saw a large drop from 113.76 to 80.9, as did our r-squared value. However, the fact that the r-squared value continued to remain above 0.5 with only three variables being regressed led us to believe that this was not solely from a large amount of variables and instead was due to the fact that the model now holds a substantial amount of explanatory power of the ease of business.

Conclusion

The purpose of this paper was to examine the effects of multiple different factors on a country in an attempt to understand further in depth what makes it easier for businesses to thrive. We examined our dependent variable *ease of business* through five independent variables. These were *gross domestic product per capita, new business density, unemployment, lending rates* and *internet users*. We found positive correlations between factors we tested for such as *unemployment* and *ease of business* formation. Considering the data was collected directly after a recessionary period, our model justifies the OC theory of productivity. The period of recession clearly caused a great macroeconomic effect on the economy. However, 'push' motives such as increased unemployment stirred economic activity in the economic activity. An increase in number of new businesses was observed in the wake of the recession. The other macroeconomic variables we observed also proved to be significant stimulants to the economy, thus, justifying our hypothesis.

We began by running a simple regression with GDP per capita as our sole explanatory variable. When it was clear that more variables had an effect on ease of business, the other four variables were added to create a multiple regression model. After running the first multiple regression model, we noticed it was insignificant even at 10%. Therefore, we dropped unemployment, and ran the model again. After this third model, we decided to also drop *internet* and as a result two effects occurred- the r-square value improved, so our new regression model better captures the variance in the data which is what we're looking for. The second effect is that the significance of all remaining variables also increased.

Despite the results of this final model, there were improvements that can still be made to the paper. The constant is extremely large and significant which means other variables still need

to be factored in. Further research must be conducted on this to find a model that captures other factors that affect ease of business in a country.

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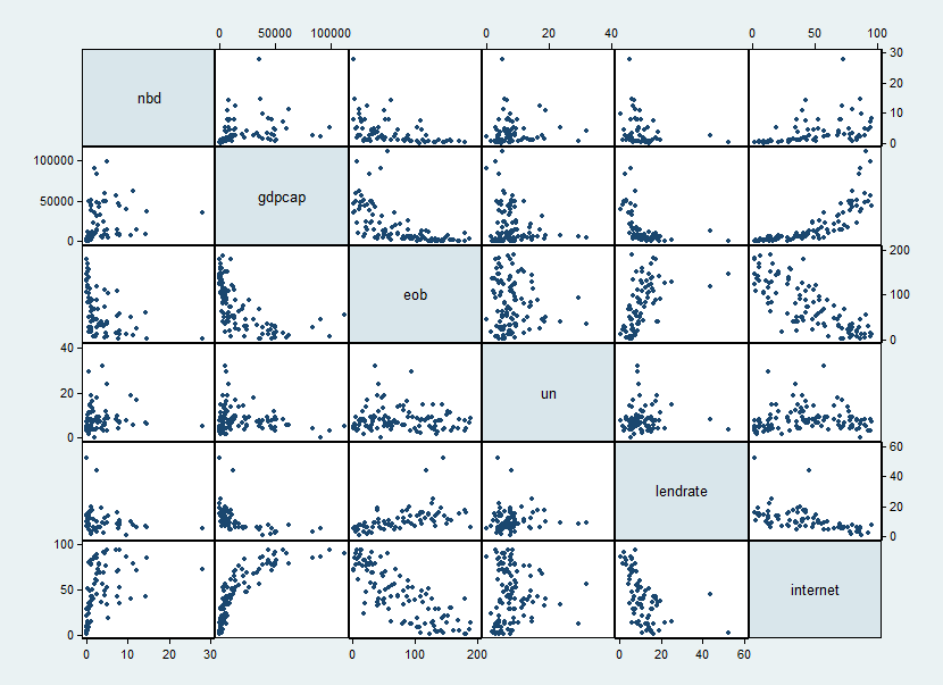
Appendix

Table 4. List of all Countries Used

Afghanistan	Costa Rica	Indonesia	Myanmar	Slovenia
Albania	Croatia	Iran	Namibia	Somalia
Algeria	Cuba	Ireland	Nepal	South Africa
Argentina	Czech republic	Israel	Netherlands	Spain
Armenia	Denmark	Italy	New Zealand	Sri Lanka
Australia	Dominican Republic	Jamaica	Nigeria	Sudan
Austria	Egypt	Japan	Norway	Sweden
Bahamas	Estonia	Kazakhstan	Oman	Switzerland
Bangladesh	Ethiopia	Kenya	Pakistan	Tanzania
Belgium	Fiji	Latvia	Panama	Thailand
Belize	Finland	Libya	Papua new guinea	Trinidad
Bhutan	France	Luxembourg	Peru	Tunisia
Bolivia	Germany	Macedonia	Philippines	Turkey
Brazil	Ghana	Madagascar	Poland	Uganda
Bulgaria	Greece	Malaysia	Portugal	UAE
Cambodia	Greenland	Maldives	Qatar	United Kingdom
Cameroon	Guatemala	Mauritius	Republic of Korea	United States
Canada	Guinea	Mexico	Romania	Uzbekistan
Chile	Hong Kong	Mongolia	Russian federation	Venezuela
China	Hungary	Montenegro	Saudi Arabia	Yemen
Colombia	Iceland	Morocco	Serbia	Zimbabwe
Republic of Congo	India	Mozambique	Singapore	

Figure 1. Correlation Matrix



Detailed Summary of Chosen Variables

Table 5. Detailed Summary for Ease of Business

eob

	Percentiles	Smallest		
1%	2	1		
5%	6	2		
10%	12	3	Obs	106
25%	30	4	Sum of Wgt.	106
50%	67.5		Mean	76.79245
		Largest	Std. Dev.	53.29785
75%	122	180		
90%	152	182	Variance	2840.661
95%	170	186	Skewness	.3726711
99%	186	188	Kurtosis	1.957427

Table 6. Detailed Summary for Gross Domestic Product per Capita

gdpcap

	Percentiles	Smallest		
1%	441	335		
5%	530	441		
10%	800	454	Obs	105
25%	3044	457	Sum of Wgt.	105
50%	8373		Mean	18717.48
		Largest	Std. Dev.	23079.57
75%	26038	83087		
90%	49441	90805	Variance	5.33e+08
95%	59898	99173	Skewness	1.799743
99%	99173	111813	Kurtosis	6.236241

Table 7. Detailed Summary for New Business Density

nbd

	Percentiles	Smallest		
1%	0	0		
5%	.1	.1		
10%	.3	.1	Obs	74
25%	.8	.1	Sum of Wgt.	74
50%	2.05		Mean	3.633784
		Largest	Std. Dev.	4.513246
75%	4.7	12.2		
90%	8	14.4	Variance	20.36939
95%	12.2	14.5	Skewness	2.730552
99%	28	28	Kurtosis	13.29175

Table 8. Detailed Summary for Unemployment

un

	Percentiles	Smallest		
1%	1.5	.3		
5%	2.5	1.5		
10%	3.4	1.7	Obs	108
25%	4.75	1.9	Sum of Wgt.	108
50%	7.6		Mean	8.244444
		Largest	Std. Dev.	5.257684
75%	9.45	19.1		
90%	14.6	23.7	Variance	27.64324
95%	18.1	29.7	Skewness	1.938068
99%	29.7	32.2	Kurtosis	8.371263

Table 9. Detailed Summary for Lending Rates

lendrate

	Percentiles	Smallest		
1%	.5	.5		
5%	2.7	1.5		
10%	4.9	2	Obs	75
25%	6.1	2.7	Sum of Wgt.	75
50%	9.4		Mean	11.15467
		Largest	Std. Dev.	8.014991
75%	14.4	21.8		
90%	17.8	25	Variance	64.24008
95%	21.8	43.9	Skewness	2.773974
99%	52.5	52.5	Kurtosis	13.94579

Table 10. Detailed Summary for Internet Users

internet users

	Percentiles	Smallest		
1%	1.1	1		
5%	2	1.1		
10%	5	1.3	Obs	109
25%	18.7	1.3	Sum of Wgt.	109
50%	42.2		Mean	44.48257
		Largest	Std. Dev.	28.55151
75%	70	92.3		
90%	85.2	94	Variance	815.1889
95%	90	94	Skewness	.1084025
99%	94	94.8	Kurtosis	1.790133